practically impossible to secure the necessary clearances to install different equipment or to provide the necessary rearrangement of the flues. This obstacle is somewhat difficult to overcome. The first installation is always difficult to secure, and in many cases it is the only one made.

A certain amount of producer gas will be lost every time the furnace is reversed. The gas regenerator and certain other parts of the furnace are full of gas prior to reversal. A portion of this trapped gas passes into the furnace and burns, but part of it will be drawn backward into the chimney ^flue. This loss cannot be eliminated. The more frequently the furnace is reversed, the greater the loss.

Wind exposure has a certain effect upon furnace operation. It affects the chimney draft appreciably. At the same time, it will have an effect upon the velocity with which the air enters the reversing valve, according to^its exposure. Mr. Allyn Reynolds stated, at the 1913 meeting of the British Iron and Steel Institute, that a wind blowing at the rate of 20 miles an hour caused a variation in the rate of flow of air into the reversing valve of 70 to 350 ft per minute. The entry rate desired was 180 ft per minute. As variations of this kind are sudden and extremely irregular, it is difficult to compensate for them.

The use of a fan for introducing the air will not eliminate such variations entirely; the fan merely causes a motion of the air within itself, taking the air from the low-pressure side and delivering it to the high-pressure side. Any increase in the suction pressure will increase the delivery rate of the fan. A great advantage of a fan, in delivering the air, lies in the fact that it renders the furnace independent of the stack effect of the regenerators and uptakes in impressing the air velocity at the port, bringing this variable more thoroughly under control. If stove-type regenera-

tors extending above the platform are used, a fan will be necessary to force the air through them.

Considerable heat is dissipated from the wall and roof surface of the regenerator chambers, the amount depending upon their exposed surface and the air or wind currents to which they are exposed. The proposal to insulate this surface has been actively considered. The problem is similar to that of the insulation of the hot-blast stove, except for the fact that the regenerator usually works at much higher temperatures than the hot-blast stove.